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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR MARCH 1935

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May 1, 1935

FRUIT INSECT INVESTIGATIONS

Storage at low temperatures prevents insect infestation in shelled pecans.--C. B. Nickels, in charge of the pecan-insect laboratory at Brownwood, Tex., reports observations on the effect of storage at low temperatures on insect infestation. A local pecan dealer had had several shipments of pecan meats returned to him because of insect infestation. As many as 28 adult Indian-meal moths (*Plodia interpunctella* Hbn.) emerged in a short time from one-fourth pound of shelled nuts. A number of samples were taken from his stock of 35,000 pounds, which had been held in storage at temperatures below 40° F. and were then stored for 30 days in a room at 70°. No insect infestation developed at any time, which indicated that holding the nut meats at low temperatures prevented insect infestation and that the infested samples returned to the dealer had undoubtedly become infested after leaving his plant.

Fumigation with chloropicrin for control of hibernating codling moth larvae.--E. J. Newcomer, in charge of the Yakima, Wash., laboratory, reports that F. P. Dean has made a study of the effect of chloropicrin on overwintering larvae of the codling moth. Larvae that had cocooned in 2-inch corrugated bands were placed in friction-top cans in a constant-temperature box. As soon as the temperature in the cans was equalized, chloropicrin was introduced and the cans were held at a constant temperature for definite periods. After exposure, the larvae were kept at room temperatures for at least a week before being examined for mortality. The following table gives the results obtained:

Temperature	: Gas concentration per 1,000 cu. ft.	: Time of exposure	: Larvae used	: Mortality
<u>° F.</u>	<u>Pounds</u>	<u>Hours</u>	<u>Number</u>	<u>Percent</u>
35.7 (av.)	$\frac{1}{2}$	24	47	57.4
35.7-----	1	do.	89	87.6
50-----	1	do.	26	100.0
50-----	$1\frac{1}{2}$	do.	94	93.6
60-----	1	do.	44	100.0
60-----	2	do.	183	100.0
70-----	$\frac{1}{2}$	8	177	24.9
70-----	1	do.	61	60.7
70-----	$\frac{1}{4}$	24	90	50.0
70-----	$1\frac{1}{2}$	do.	124	28.2
70-----	1	do.	177	100.0
70-----	2	do.	78	100.0
80-----	1	do.	64	100.0
80-----	2	do.	157	100.0
Check-----	--	--	125	0.

$\frac{1}{2}$ Constant temperature not used. Actual temperature ranged from 28° to 42° F.

It seems apparent that in a practically airtight container, 1 pound to 1,000 cubic feet is sufficient for a 24-hour exposure at any temperatures above 50°F.

Emulsions of ethylene dichloride effective against peach borer larvae in dug nursery stock.--O. I. Snapp and J. R. Thomson, Jr., of the Fort Valley, Ga., laboratory, have just reported experiments which show that a 5-percent emulsion of ethylene dichloride sprayed on the soil over dug nursery stock, heeled in in an upright position, at the rate of 1 quart to each bundle of 15 trees, will eliminate practically all larvae of the peach borer (*Aegeria exitiosa* Say) without injuring the trees. Much better results were obtained when the trees were in an upright position than when heeled in at an angle of 45°, apparently because of the fact that the gas has to travel a greater distance before reaching the trees at the bottom of a bundle when they are in a slanting position. Ten-percent emulsions of ethylene dichloride caused considerable injury to some of the trees.

Grape pomace as a trap for grape leaf hoppers.--G. A. Runner, in charge of the grape-insect laboratory at Sandusky, Ohio, reports that on numerous occasions it has been noticed that grape leaf hoppers are attracted in immense numbers and frequently from considerable distances to pomace heaps located near vineyards. Last October a large quantity of grape pomace from a wine press was hauled to a weedy place bordering a vineyard. Large

numbers of three-banded leaf hoppers (Erythroneura tricineta Fitch) were soon attracted to the locality and were still very abundant during the latter part of March. Although about one-half mile of the border of this vineyard was examined, and although the shelter afforded the leaf hoppers was similar to that near the pomace heap, they were at no other place equally numerous. The hoppers attracted to the pomace in the fall evidently remained in the same locality over winter. The area providing winter shelter to the leaf hoppers was easily burned over and great numbers of the insects were destroyed.

DATE SCALE CONTROL

Nearly 3,000 date palms inspected in March.--Clean-up work was continued in the infested areas at Yuma, Ariz., and at El Centro and in the Coachella Valley, Calif. A total of 355 bushy palms was pruned to facilitate inspection. Fiber was stripped and leaf bases removed from 70 previously infested palms in Yuma. Inspection of the Reed Date Garden in the Imperial Valley was completed during the month and no scale was found. This is the only commercial planting still considered infested and in which ground and ladder inspection is being carried on at frequent intervals. The last infested palms were found in this garden in February 1934. During the month 2,201 palms in the infested areas were inspected from the ground only and 766 from ground and ladders.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Cultural treatments for control of sugarcane borer in corn and Egyptian wheat.--August I. Balzer, Beaumont, Tex., reports results of examinations of corn debris and Egyptian wheat debris from two areas of 1 square rod each. Cultural treatments were made on November 2, 1934, and examinations were made on March 6, 7, and 8, 1935. The numbers of sugarcane borers found after the various cultural treatments are shown in the following table. At the time of treatment the corn plats showed an average of 68 living larvae per square rod and the Egyptian-wheat plats an average of 300 per square rod.

Treatment	: <u>Diatraea saccharalis</u> Fab. :				Total
	: Living :		: Dead :		
	:		: Larvae and :		
	: Larvae: Pupae :		: pupae :		
<u>Corn</u>	: Number:	: Number:	: Number	: Number	
Standing stalks-----	8	1	74	83	
Stalk cutter only-----	3	0	39	42	
Disc only-----	2	0	31	33	
Cutter and disc-----	1	0	15	16	
Cutter and middle "buster"-----	0	0	7	7	
Cutter and disc, and middle "buster"-----	1	0	2	3	
<u>Egyptian wheat</u>	:	:	:	:	
Standing stalks-----	13	0	48	61	
Stalk cutter only-----	6	0	21	27	
Disc only-----	2	0	22	24	
Cutter and disc-----	4	0	9	13	

Survival of corn earworm pupae at Arlington Farm, Va.--F. F. Dicke, Arlington Farm, Va., reports that an area of approximately 200 square yards devoted to late sweet corn was examined late in March to determine to what extent Heliothis obsoleta Fab. had survived the winter. This area yielded a total of 79 pupae, 60 of which, or 76 percent, were living. Since considerable mortality occurs normally in the early pupal stage, it is evident that the mortality during the winter was unusually low. There was no significant difference between the depths at which the living and dead pupae were found. Although below-zero temperatures occurred in the vicinity of Washington, D. C., the ground was well protected by snow from frost penetration. Early in the fall the soil was unusually wet and the mortality was heaviest on low ground. Of the 19 dead pupae, it was determined definitely that 2 had been killed by disease. The dead specimens were usually found either embedded in their pupal chambers or heavily coated with silt. In the course of these examinations, hundreds of fall armyworm pupae were observed; however, not a single living specimen was recovered.

Pea aphid damage expected in California and Nevada.--An outbreak of Illinoia pisi Kalt. on alfalfa appears probable in the Antelope Valley of southern California this spring. The severity of this will depend upon weather conditions during early April. Periodic observations in western Nevada indicate the possibility of an outbreak there also.

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Oviposition and larval abundance of Japanese beetle in cultivated fields.--I. M. Hawley and T. M. Dobbins, Moorestown, N. J., report that in 1934 an area approximately 1 mile square was selected in Salem County, N. J. During the summer of 1934 observations were made on beetle behavior and cultural practices in 70 fields in this area, and during the fall larval surveys were made in about 40 of these selected fields. Early in the season beetles fed most heavily on sassafras, wild grape, Virginia creeper, and smartweed until the available supply was destroyed. Early in July they moved to apple trees and fed until the foliage of these was destroyed, when they moved to lower, more succulent food plants, such as asparagus brush and corn. Late in June the beetles were observed balling in and on the surface of the ground early in the morning, then about 9 a.m. they would begin to fly and collect in large balls on plants along fence rows, more for mating than for feeding. The reason for larvae of the Japanese beetle occurring in fields planted to cultivated crops upon which the adults do not feed has always been questioned. It was noted that many beetles while in flight above such fields suddenly dropped and at once dug down between dry clods into the moist soil beneath. This was especially noticeable whenever a cloud passed over the sun. Between September 1 and December 1, 3,077 surveys were made in the fields in this area. The average larval population was 13.7 per square foot in pastures, 6.2 in alfalfa fields, 6.6 in cornfields, 6.2 in asparagus fields, 3.0 in tomato fields, and 2.3 in fields planted to pumpkins. Beetles do not feed on the two last-mentioned plants, but beetles in flight were observed to drop and enter the ground in these fields.

Percentage of diseased Japanese beetle larvae.--Messrs. Hawley and Dobbins state that in the total field population under various conditions the percentages of diseased larvae were as follows: Pastures, 0.5; cornfields, 1.5; alfalfa fields, 2.4; asparagus fields, 1.5. For the period during which these surveys were made, diseased larvae averaged 3.2 per square foot in sod land in the seasonal series of surveys in the older infested area.

Japanese beetle larvae develop faster in sod land than in cultivated fields.--Early in October, according to Messrs. Hawley and Dobbins, 95 percent of the larvae in pastures had reached the third instar, but in cornfields never more than 85 percent had reached this stage by the first of November. Larvae in asparagus, pumpkin, and tomato fields were as slow or slower in development than those in cornfields.

Stickers for derris.--L. D. Goodhue, Moorestown, submits the following results which were obtained by spraying lima bean leaves with a mixture consisting of 1 percent derris and 0.5 percent of the sticker.

Material	: Loss after washing
	Percent
Blown sardine oil ^{1/} ----	5, 10
Blown menhaden oil ^{1/} ----	10, 20
Blown menhaden oil ^{2/} ----	15, 25
Raw menhaden-----	45, 50, 55
No sticker-----	90, 95

^{1/} A very viscous oil almost solid at room temperature.

^{2/} A less viscous oil than either the blown sardine or the first menhaden sample.

Decomposition of derris.--The rate of decomposition of derris in sprays can be reduced by excluding all light or the part of the spectrum that is responsible for this decomposition. The table below shows the amount of active derris remaining on glass plates exposed to the sunlight according to the method already reported.

Material added	: Derris remaining after--
	: 3 days : 10 days : 17 days
Percent	^{1/} : Percent : Percent : Percent
Lampblack----- 10-----	54 : 45 : 25
Titanium dioxide (in oil)- 10-----	25 : 16 : 8.3
Aluminium powder (do.)- 15-----	40 : 20 : 25
Chrome green (do.)- 15-----	31 : 15 : --
Chlorophyll (do.)-----	19 : 19 : 8.7
Chlorophyll (do.)-----	37 : 31 : 7.5
None----- 0-----	16 : 11 : 2.2

^{1/}Based on amount of derris. The percentage of chlorophyll in the cottonseed oil was not known.

Lampblack mixed with dry derris does not appear to give any protection when blown fish oil is used as a sticker. In previous tests, lampblack mixed dry with derris gave protection where agar was used as a sticker. Apparently the active principle in derris is being extracted by the blown fish oil. If this is true, it will be necessary to add the protective agent to the sticker instead of to the dry derris. This also suggests an important method of attack, as it will be possible to use antioxidants in the sticker.

Propagation studies with imported parasite of Japanese beetle.--In connection with the propagation of Tiphia popilliavora Roh., M. H. Brunson, Moorestown, reports that there are many of the parasitized hosts on which the Tiphia cocoons fail to form. A darkened area surrounding the point of attachment of the parasite egg on some hosts suggested that the dislodgment of the egg or small larva was not always the cause of the failure to form a cocoon. A number of host larvae showing the darkened area were sectioned, and the darkened area was found to be caused by a heavy deposit of chitin. In many cases the heavy layer of chitin was ten or more times as thick as the chitinous layer on a normal host. This condition suggested that possibly many parasite larvae died because they could not attach themselves to the host through this heavy covering, as they must necessarily do after hatching and after their first three molts. Apparently, either the presence of the parasite or the massaging of the host by the female parasite prior to egg attachment stimulates the hypodermal cells to secrete the heavy chitinous layer which might serve to protect the host from the parasite's attack.

Oviposition tests with native species of Tiphia.--R. T. White, Moorestown, has been conducting studies to determine to what extent native Tiphia species attack Japanese and Asiatic beetles and native hosts. Oviposition tests were conducted, using 10 Tiphia atlantis Allen and Jaynes, a native Tiphia found rather abundantly at Vincentown, N. J. Larvae of Macroductylus subspinosus Fab., Pachystethus lucicola Fab., Ochrosidia villosa Burm., Autoserica castanea Arrow, Arthonus castaneus Melsh., two species of Phyllophaga, and Ponillia japonica Newm., were used alone and in various combinations with these Tiphia. Only one egg was obtained on a P. japonica grub, and only one on a large species of Phyllophaga. Both of these failed to develop. Eggs were readily laid on a small Phyllophaga species and 61 percent of these eggs formed cocoons in an average of 31 days, at an average temperature of 72.8° F. These tests indicate rather conclusively that Tiphia atlantis will not accept P. japonica as a host, its natural host unquestionably being the small species of Phyllophaga found locally in the Vincentown area. It is seemingly very specific in its choice of host. Tests were also conducted with another native Tiphia species, Tiphia intermedia Malloch, found rather abundantly during August and September. This species accepts grubs of P. japonica readily, as only two individuals of this species were used, one of which died after laying 20 eggs in 24 days, whereas the other lived 47 days and laid 69 eggs. At the time of examination for cocoons, 32.5 percent of the grubs used were found alive with egg scars, showing that the eggs had not been securely attached to the host. Of

the remaining grubs, 40.0 percent formed cocoons, thus showing that only 27.0 percent of the total number of eggs laid formed cocoons. Although this Tiohia readily accepts P. japonica as a host, its effectiveness as a Popillia parasite is limited, because of its failure to securely fasten its eggs to the host.

JAPANESE BEETLE CONTROL

Additional inspectors employed to supervise nursery shipments.--With business at nurseries and root-growing establishments mounting daily, inspection demands increased proportionately. A number of Japanese beetle inspectors temporarily assigned to Dutch elm disease eradication work returned to nursery and greenhouse supervision. In order to fulfill the emergency demands for inspection in New Jersey, one inspector was transferred from the Trenton district to the Glassboro section and another inspector was hired to assist in the White Horse district. A large increase in personal inspection calls made and certificates issued was reported from all districts of the regulated territories.

Experiments with paradichlorobenzene for destruction of Japanese beetle larvae extended.--Cooperative trials in fumigation with paradichlorobenzene by the Japanese beetle research laboratory and commercial growers have been extended to include blueberry, holly, franklinia, and rhododendron plants. Treatments of azaleas with this material have been so successful in two instances that growers who supplied plant material for the trials have requested additional fumigations.

Locust stock for soil-erosion control certified from New York.--Certifications in the New York area during March included two carloads totaling approximately 2,000,000 locust cuttings. They were shipped to Hoffman, N. C., where they will be used by the Federal Government in soil-erosion control operations. There were also certified for shipment from Long Island during March a total of 10,300 locust roots destined to points in Iowa, Ohio, Missouri, and Arizona. These will be used in experiments to determine the resistance of this variety to the locust borer.

Highway patrols for Japanese beetle quarantine started.--Road-patrol activities for 1935 were begun on March 29 with the establishment of two posts on the exit highways leading from the regulated area in Virginia. Additional posts were opened on two highways in the same section on March 31. These stations were established in time to check on the southward movement of plant stock for Easter sales. Expansion of the patrol system will be made as the movement of plant material increases with the advancing spring shipping season.

Scouting determines extent of gypsy moth infestations.--From observations made in the Lebanon, N. H., district since the last gypsy moth egg-laying season, it is apparent that the present distribution of egg masses is much the same as last year. Scouting in the vicinity of an infestation at Wells River, Vt., showed that it was still confined to an area adjoining the highway. Twenty-four men-hours of rough scouting in the town of

Fairfield, Maine, resulted in the creosoting of 724 gypsy moth egg clusters. This survey was made while the area was covered with 3 feet of snow. C. C. C. crews have been creosoting egg clusters in the vicinity of Laconia, N. H. A heavy infestation in this locality borders a much-traveled highway. In Meredith, N. H., the town has a foreman and a crew of six men painting egg clusters within the village limits. This locality is also heavily infested.

Production mounts in face of personnel turnover in Dutch elm disease work.--Defections from the eradication crews began early in March, when many of the experienced tree surgeons and tree climbers resigned to resume their own private businesses or return to their former positions with commercial tree firms. Newly enlisted men will require conditioning before assignment as replacements in eradication crews. High water in many swampy sections containing high concentrations of dead and dying elms also hampered the work in such areas. Despite these handicaps the crews eradicated during the month a total of 137,836 dead and dying trees and 149 diseased specimens. Scouts surveying the work area for dead and dying trees, tagged a total of 223,026 trees, bringing the grand total of dead and dying trees located since the winter campaign began to 571,555, of which total 335,131 were still standing.

Four-page pamphlet on Dutch elm disease issued.--Receipt from the Government Printing Office during the month of Department Circular No. 353, "The Dutch elm disease eradication project: Federal, State, and local co-operation", by L. H. Worthley, is proving of considerable assistance in answering the large volume of correspondence received daily from community officials, clubs, and individuals interested in combating the disease. A generous supply of the circular is available for distribution wherever there is a demand for information on this subject.

FOREST INSECT INVESTIGATIONS

Reemergence complicates life history of western pine beetle.--Results secured by K. A. Salman, of the Berkeley, Calif., laboratory, by caging infested trees in the Modoc National Forest indicate that reemergence of some adults and even a second reemergence of some individuals is a normal feature in the life history of the western pine beetle infesting ponderosa pine in California. As many as one-fourth of the adults originally attacking a green tree reemerge from that tree after laying eggs, and join in attacks on other green trees. This results in the maintenance at a high level of the population in any given attack found during the active season, a level much higher than would be the case if the natural rhythm of the primary generations were not complicated by the attacks of the reemerged adults.

Flathead-borer infestation found to reduce effectiveness of western pine beetle broods.--Dr. Salman also reports that experiments with forced attacks by the western pine beetle on ponderosa pine trees in the Modoc National Forest showed that flathead borers, Melanophila californica Van Dyke, when attacking trees also infested by the western pine beetle, reduced the effectiveness of the latter. On one tree in which infestation

by the two species occurred in the bark covered by one emergence cage but not in that covered by a second cage, the flatheads resulted in a net production of but 18 western pine beetle adults per square foot, as against 121 per square foot where flathead broods did not occur. On another tree in which infestation by the two insect species occurred, the net emergence was but 24 percent of the number of individuals that attacked the same bark area.

Western pine beetle larvae fail to develop after prolonged exposure to cold.--J. M. Miller, of the Berkeley, Calif., laboratory, announces that studies conducted at that laboratory have shown that mature larvae of the western pine beetle are killed by cold at temperatures ranging from 5° to $-7\frac{1}{2}^{\circ}$ F., 1 hour of exposure being sufficient to kill all individuals at the latter temperature. At higher temperatures within this range, certain larvae will die and others survive. This is apparently owing to some metabolic condition in certain larvae which enables them to resist freezing. Following short exposures to temperatures ranging from 5° to -5° , these survivors will resume development, pupate, and transform to adults when brought back to warm temperatures, around 70° to 80° . Recent studies have shown, however, that if the exposure is prolonged, survivors lose their ability to continue development. Tests at 0° F. show that surviving larvae are capable of completing development if the exposure does not exceed 4 days. With 5 days' exposure, practically no surviving larvae were capable of resuming development. When the period of exposure was extended from 6 to 18 days, about 10 percent of the larvae survived and continued to live. However, these survivors were unable to pupate and all died within 60 days when brought back to warm temperatures. These results indicate that in the field a prolonged cold spell, with temperatures around zero, will produce a much higher mortality of the overwintering population of the pine beetle than will a brief period of cold.

Winter control work on Lassen National Forest completed.--Lumberman Vance Brown, of the Forest Service, has just completed a summary of work accomplished on the Hall's Flat and Little Valley Control projects on the Lassen National Forest. This work extended from November 15 to March 1. A total of 5,000,000 board feet of infested timber was treated at a cost of \$28,000. These projects were a battle with heavy snow and other trying conditions. The spotters were obliged to cruise continually on snowshoes until the last week or two of the period. This condition, combined with a heavy infestation, exceeding 600 trees on some sections, made the work of spotting slow and expensive.

Subzero temperatures kill overwintering mountain pine beetle broods.--A. L. Gibson and T. T. Terrell, of the Coeur d'Alene, Idaho, laboratory, spent 2 weeks in the latter part of January and the early part of February in southwestern Montana, northwestern Wyoming, and east-central Idaho, to determine the effect of a period of severe cold on the overwintering stages of the mountain pine beetle in lodgepole and white-bark pine. Samples taken from infested trees in different areas and at various elevations and exposures were brought to the Coeur d'Alene laboratory, where they were

examined to ascertain the extent of mortality. Temperature records from the various areas showed that the severe cold had occurred only over a limited area extending from the Yellowstone River Valley north of Yellowstone Park and south of Livingston, Mont., west to the Big Hole Basin and south to the Idaho, Montana, and Wyoming State lines. In comparing samples from this area with those from areas of more normal winter temperatures, it was found that the subzero weather had apparently resulted in some mortality. Within the cold belt, mortality ranged from 40 to 84 percent in lodgepole pine and from 10 to 48 percent in white-bark pine. In the areas of warmer temperatures, the mortality was found to be only from 9 to 14 percent.

Bark-beetle control projects in the northern Rockies.--James C. Evenden, Coeur d'Alene, reports that control operations against bark-beetle outbreaks on the Coeur d'Alene National Forest in Idaho, the Blackfeet Indian Reservation in Montana, and the Shoshone National Forest in Wyoming have been recommended for the coming season. These projects will all start as early in the spring as weather conditions will permit. On the Coeur d'Alene Forest this season's operation will be the sixth year of control that has been directed against an outbreak of the mountain pine beetle in western white pine. This project is the largest operation planned for the coming spring, and will involve an expenditure of approximately \$63,000 for the treatment of 8,500 trees. Some of the work in connection with this operation will be conducted by C. C. C. labor, while regular control crews will be used in the more inaccessible areas. On the Blackfeet Indian Reservation, control measures will be instituted against an outbreak of the Douglas fir beetle in the scenic and commercially valuable Douglas fir stands of that area. The Shoshone National Forest project is also directed against an outbreak of the Douglas fir beetle in stands of Douglas fir previously defoliated by the spruce budworm, and this will be the fifth year control has been conducted against this insect in that area. As a result of these 4 years of control, the general infestation has been reduced 82 percent and the scenic forests of that area have been preserved.

Winter mortality of locust borer larvae.--R. C. Hall, of the Columbus, Ohio, laboratory, reports that recent examinations of a number of locust trees have indicated that the winter mortality of locust borer larvae in northeastern Ohio has been approximately 8 percent.

Insects transmit Dutch elm disease.--W. D. Buchanan, of the Morristown, N. J., laboratory, reports two additional positive cases of transmission of the Dutch elm disease by Scolytus multistriatus Marsh. Mr. Buchanan accomplished this by a technic he has not seen described before, but which has a bearing on a type of transmission he believes to be important in the field. In experiments the beetles were reared from a diseased tree and placed in battery jars with sections of disease-free logs in which to construct their egg galleries. After the galleries had been formed, several were cut out and plated by C. S. Moses, of the Bureau of Plant Industry. Ceratostomella ulmi was isolated from two of the four logs used in the experiments.

Severe termite damage in New England.--Recently R. A. St. George, Washington, D. C., found severe termite damage in several houses in Plymouth, Mass. Many sills and some of the uprights had to be replaced. Houses only 9 years old had every floor joist damaged. One floor laid 2 years ago was quite badly infested. In another building it is reported that where the termites had been cut off at the first floor they had extended numerous shelter tubes from 2 to 12 inches long through the ceiling over night. One tube was left undisturbed and attained a length of 30 inches before they stopped. Other timbers in place only 2 weeks were found to have been attacked. The repair work on these houses was of particular interest, as the contractor is following out rigidly the Department's recommendations for control. This, among other measures, includes the use of termite shields in termite-proofing the houses. Other cities reported to have extensive termite damage in places are Acton, Concord, Littleton, Cambridge, Northampton, and Holyoke, in Massachusetts, and New Haven and Westport, in Connecticut.

GYPSY AND BROWN-TAIL MOTH CONTROL

Scouting for gypsy moth in New England.--In the New England section of the barrier zone scouting was continued during March, in Massachusetts, in the extreme southwestern part of Berkshire County, and in Connecticut, in the northwestern part of Litchfield and the southern part of New Haven Counties. In the former State over 9,000 acres of woodland and nearly 50 miles of roadside in open country were scouted and only 2 gypsy moth egg clusters were found and destroyed. In the latter State over 5,000 acres of woodland and 14 miles of roadside in open country were examined, and over 1,100 egg clusters were found and destroyed. The gypsy moth work in New England, east of the barrier zone, has been continued during the month in 18 different C. C. C. and V. C. C. camps. During the month scouting was performed by assigned quotas from the different camps in towns in the immediate vicinity of their locations. These scouts covered 71,936 acres of woodland and 352 miles of roadside, in open country, and destroyed 78,751 gypsy moth egg clusters.

Gypsy moth work in Pennsylvania.--In Pennsylvania, scouting by the 40-foot strip method or by the intensive method practiced in areas of known infestation was carried on in eight towns in the infested area. Over 7,000 acres of woodland and 15 miles of roadside in open country were scouted and 4,798 egg clusters were found and destroyed.

One gypsy moth egg mass found in New Jersey.--In New Jersey, around the area where male gypsy moths were attracted to assembling cages in the summer of 1934, 349 acres of woodland and 3½ miles of roadside in open country were scouted and one gypsy moth egg cluster was found and destroyed.

PLANT DISEASE CONTROL

Blister rust control work in South Carolina.--Roy G. Pierce, regional supervisor of blister rust control work in the southern Appalachian States, gives the following summary of control work in South Carolina for the year

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1934: In South Carolina, which is at the extreme southern limit of its range, white pine makes a rapid height growth, 2 feet per year being very common, while an occasional 3-foot growth has been noted. Reproduction is taking place wherever seed trees are numerous. On the property of a prominent citizen of Pickens there are three large white pines ranging from 9 to 11 feet in circumference and approximately 100 feet in height. In their immediate vicinity, on an area of $1\frac{1}{2}$ acres, between 400 and 500 young white pines have seeded in. As a result of our interest in his white pines, the owner has cleared out the brush and weed trees and is giving the young pines a chance to survive. Although no native wild Ribes were located, cultivated bushes of three species were found in abundance in the white pine section, viz, Ribes grossularia, the common garden gooseberry; R. rotundifolium, the roundleaf gooseberry; and R. vulgare or sativum, the cultivated red or white currant. At 58 places in Oconee and Pickens Counties a total of 2,213 of these cultivated bushes were destroyed with the owners' consent.

Effect of logging practice on Ribes growth.--Field observations made during the past 3 years in the Inland Empire western white pine areas indicate that wild Ribes growth may be controlled to a considerable extent by regulating methods of logging and brush disposal. In this region Ribes are generally temporary species in the upland forest types. The Ribes are carried over from one forest cycle to another by means of dormant seeds which remain viable in the lower strata of the forest mantle. These seeds germinate and establish new plants only when the forest mantle is destroyed or severely disturbed, as by forest fires or logging operations. It was observed that areas on which the brush had not been burned after logging showed the lowest average number of Ribes viscosissimum. Areas on which the brush was piled and burned showed a 30 percent increase in the number of Ribes over areas on which the brush was not burned. The greatest number of Ribes found after logging appeared on areas where the timber was clear-cut, followed by a broadcast burning not sufficiently intense to consume all of the organic mantle.

Barberry spread in the drier areas of South Dakota.--A recent report from R. O. Bulger, district leader in charge of barberry eradication in South Dakota and Nebraska, briefly summarizes a situation that was encountered in Meade County, S. Dak., in 1934. Mr. Bulger reports that an inspection was made of an old ranch located not far from the foothills of the Black Hills region, where some planted barberry bushes had been eradicated some years ago. The average annual rainfall in this area is less than 20 inches and the vegetation more or less typical of the "west river" country. An area consisting of 20 sections was surveyed around this location, with the result that more than 70 barberry bushes, some of them from 6 to 7 feet tall and producing seed, were eradicated. The bushes were scattered among wild plum and buffalo berry along ravines where the seed had been distributed by birds. According to Mr. Bulger, the work conducted in 1934 indicates that there is considerable territory in western South Dakota that may require intensive inspection to insure eradication of remaining bushes.

Testing barberries for reaction to stem rust.--L. M. Ames, Jamaica Plain, Mass., reports that during the past year more than 200 separate collections, representing about 110 distinct species and varieties of barberry, were obtained largely from the Arnold Arboretum and sent to the barberry garden at Bell, Md., for propagation. The purpose is to make outdoor susceptibility tests of all available barberry species, varieties, and hybrids. The first outdoor test inoculations of these species and seedlings were made by R. U. Cotter in September 1931. Mr. Cotter is now (April 15) making inoculations for a second outdoor test of the entire barberry collection at Bell.

COTTON INSECT INVESTIGATIONS

Toxicity tests for boll weevil, cotton leaf worm, and *Lygus apicalis*.--G. L. Smith, J. C. Clark, and A. L. Scales, Tallulah, La., conducted a large series of cage toxicity tests with a number of insecticides for the boll weevil, the cotton leaf worm, and *Lygus apicalis* Fieber at that laboratory in 1934. Phenothiazine was tested at 5, 10, 25, 50, and 75-percent, diluted with sulphur, tobacco dust, kaolin, hydrated lime, and also at full strength. It was not effective against any of the insects, even at full strength. Powdered derris and cube root were used at 0.5, 1, 2, and 4-percent rotenone content. Derris was mixed with kaolin, sulphur, tobacco dust, and lime, whereas only kaolin was mixed with cube. Derris containing 4 percent rotenone killed 92 percent of the weevils, as compared to an 82-percent kill for calcium arsenate and a 75-percent kill for cube with 4 percent rotenone. At the lower concentrations derris was not effective, although the kill was better at all concentrations in all of the tests than was cube of the same rotenone content. Against the leaf worms derris (4 percent rotenone) killed 73 percent of the leaf worms, as compared to a 60-percent kill for cube of the same strength and a 93-percent kill for calcium arsenate. Neither derris nor cube were effective against *Lygus*, the kill being 45 and 41 percent, respectively. Pyrethrum dust containing 0.25 percent pyrethrins I and II was tested against boll weevils and leaf worms. The kill was low for weevils but for leaf worms was equal to calcium arsenate. A mixture of 80 percent calcium arsenate and 20 percent copper arsenite killed 79 percent of the weevils, as compared to an 85-percent kill with calcium arsenate. There was some burning of the foliage with this mixture. Mixtures of calcium arsenate and lime (1 - 1 and 1 - 2) caused a mortality of 70 and 66 percent of the weevils, respectively, as compared to a kill of 86 percent with calcium arsenate. Hydrated lime alone caused no appreciable increase in kill over the checks. Sulphur was tested in various combinations with paris green, calcium arsenate, sodium fluosilicate, and derris against the boll weevil, the leaf worm, and *L. apicalis*. Sulphur alone had very little effect on the leaf worm, was about half as effective against the boll weevil as was calcium arsenate, and gave fair control of *Lygus*. Mixtures of 1 part paris green with from 2 to 4 parts of sulphur caused a high kill of boll weevils, leaf worms, and *Lygus*, but all of these combinations caused considerable burning of foliage. Calcium arsenate, mixed with from 1 to 4 parts of sulphur, was not as effective against the weevil as was the undiluted calcium arsenate, but all concentrations gave a high kill and were equally as effective against the leaf

worm as was calcium arsenate. Sulphur mixed with sodium fluosilicate decreased its effectiveness and caused burning. Undiluted paris green was the most toxic insecticide tested against all three species, but caused considerable damage to the foliage. However, the burning from undiluted paris green was not so severe as from the sulphur-paris green mixtures. Lime added to paris green (1 - 1, 1 - 2, and 1 - 3) decreased the burning and the toxicity to the insects in proportion to the quantity added. Mono-hydrated copper sulphate was not effective, either alone or in mixtures, against any of the three insects.

Time-of-day applications of calcium arsenate.--Messrs. Smith, Clark, and Scales also conducted a series of cage tests at Tallulah to determine the time of day when calcium arsenate dusting was most effective for weevil control. Series of 18 cages each were dusted at sunrise, at noon, and at sunset during August. The mortality in cages dusted at sunrise was 84 percent; in those dusted at noon, 77 percent; and in those dusted at sunset, 72 percent.

Boll weevil survival in various types of shelter.--The annual spring examinations of Spanish moss to determine the number of boll weevils that survived the winter in that shelter were made from March 4 to 12 at Tallulah, La., and at Florence, S. C. At Tallulah an average of 5.2 live weevils were found per ton of moss examined and at Florence an average of 4. Examinations have been made at Tallulah for the past 20 years. In 10 of these years, a larger number of live weevils were found per ton of moss examined than in 1935 and in 10 years a smaller number of weevils were found than in 1935. The same number of live weevils were found at Florence in 1934 as in 1935, but the number found in 1935 was less than the number found in any of the years from 1929 to 1933, inclusive. Two hundred and eighty 3 by 6 ft., or 18 sq. ft. samples of such shelters as wood's trash, weeds, grass, soil, rotten stump, rotten log, cornstalks, and cotton stalks were collected and examined for hibernating boll weevils. Examinations at Tallulah were made during January and February and at Florence during December, January, and February. Samples were collected at Tallulah in cotton fields, adjacent to cotton fields, and at distances of 25, 50, 100, 150, 200, and 300 feet from the fields. All of the weevils found were within 100 feet of cotton fields. At Florence samples were collected adjacent to cotton fields and at distances of 150 and 300 feet from the fields. All weevils found were in the samples adjacent to and 150 feet from the fields. At Tallulah an average of 663 live weevils per acre were found for all types of shelter examined and, at Florence, an average of 175 live weevils were found.

Notes on cotton root aphids.--In reporting observations of 33 consecutive generations of the brownish-purple cotton root aphid (Rhopalosiphum sp.), F. T. Bondy and C. F. Rainwater, Florence, S. C., state: "This species is able to pass the winter in all stages in South Carolina, and during December, January, February, and March, it went through approximately eight complete generations. About the middle of March the white root louse (Trifidaphis phaseoli (Pass.)) was found abundantly on the roots of vetch. The corn root aphid (Anuraphis maidi-radicis Forbes) was found on the roots of several host plants throughout the winter, and on April 2 was found on the roots of vetch and four other plants."

Cotton flea hopper.--The first hatching of cotton flea hopper nymphs from overwintering eggs in hibernation cages at Port Lavaca, Tex., was reported by K. P. Ewing and R. L. McGarr on February 19. During February and March a total of 3,039 nymphs hatched, as compared to 19,931 nymphs from comparable cages during 1934. During the first quarter, the minimum temperature was 19.5° F., as compared to 30° in 1934. The mean temperature this year was 68° or over 7° higher than for the corresponding period last year. Rainfall was 5.24 inches, as compared to 12.17 inches for the first quarter of 1934. Nymphs were found on March 6 and on March 25 adults were collected on goatweed. At College Station R. W. Moreland found nymphs on croton during the last week of March. The first adult hopper taken by sweeping weeds was collected on March 28; however, 2 days previously J. C. Gaines had collected at College Station, Tex., 7 adults on screens, indicating that they were migrating at that time.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Pink bollworm control work in Florida.--Most of the work in March has consisted in completing the recleaning of wild-cotton areas previously cleaned and the cleaning of a few new small colonies located near the recleaned areas. The situation from Key Largo to Key West is very encouraging, as all of this area has been recleaned, and in some sections where wild cotton was very abundant a second recleaning this season has been made. Practically all of the old area along the west coast has also been recleaned, but a few new colonies, located during this recleaning, were not cleaned. These new colonies, however, are all very small and do not present any new or difficult problems. Work in the Florida Bay section had to be discontinued before all of the old areas had been recleaned. During the month some 490 acres were recleaned, from which 904 mature, 110,200 seedling, and 6,522 sprout plants were removed. The new colonies cleaned for the first time covered 31 acres and contained 6,141 mature and 1,936 seedling plants. During this recleaning some wild cotton bolls were inspected but no specimens of the pink bollworm were found.

Trap-plot cotton in the Big Bend area of Texas.--All of the trap-plot cotton in the Big Bend was planted between March 10 and 26. As previously mentioned, there are 2 plots in the Castolon district in Brewster County and 8 in the Presidio district in Presidio County. The cotton is now up to a good stand. The 2 plots at Castolon are making very rapid growth, some of the plants now having four leaves. In the Presidio section, because of cool nights and some windy days, the plants have not been making such rapid growth; however, they should be far enough in advance of the main crop to serve their purpose. All of the farmers intend to observe the delayed planting date of April 15. On the Mexican side a few farmers may plant about April 10 because of water conditions, but the majority will not do any planting until after the 15th.

Thurberia weevil in Arizona.--As a result of laboratory inspection, another light infestation of the Thurberia weevil has been located on a farm 5½ miles north of Tucson. This makes a total of five farms on which infestation has been found in the 1934 crop. All infestations are very light,

and the fact that gin-trash inspection was negative indicates that they occurred late in the season on the top crop of bolls. Recent reports are to the effect that so far this year rainfall is a little above normal and, as a result, weevils are beginning to emerge somewhat earlier than usual from the *Thurberia* plants in the mountains. In all probability these early weevils will not be of any consequence, as there is not yet any material for them to feed on.

Laboratory inspection for the pink bollworm.--Laboratory inspection at San Antonio and a number of field stations has gone forward satisfactorily. So far, 25 specimens of the pink bollworm have been found. These were taken from material collected in two of the older infested areas--the El Paso Valley of Texas and the Pecos Valley of New Mexico. It is of interest to note that results have been negative, not only in the material inspected from the newer infested areas, but in material from outside the regulated areas.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Asparagus affords unfavorable environment for Pacific coast wireworm.--E. W. Jones and K. E. Gibson, of the Walla Walla, Wash., laboratory, report that in 1932 soil samples disclosed that there were approximately 14.72 *Limoni* (*Phaeletes*) *canus* Lec. per square foot at the time an acre of garden land was planted to asparagus. Similar samples taken in this asparagus field 3 years later (March 1935) yielded an average of approximately 5.64 of these wireworms per square foot. This represents a reduction of approximately 62 percent in the original wireworm population during the 3-year period.

Relative humidity is an important influence on Mexican bean beetle development.--N. F. Howard and R. W. Brubaker, of the Columbus, Ohio, laboratory, report that experiments conducted in temperature cabinets showed that a temperature of 89.6° F., with a relative humidity of 60 percent, was more favorable for the duration of life of adult Mexican bean beetles and for the development of bean beetle larvae on potted plants, than was the same temperature at 80-percent relative humidity. However, in these series of tests the bean beetle pupae, when exposed to the same temperatures, developed slightly faster and yielded a higher percentage of adults at 80 percent humidity than at 60 percent.

Life-history studies conducted on a mushroom fly, *Sciara* sp.--In life-history studies of *Sciara* sp., A. C. Davis, of the Takoma Park, Md., laboratory, obtained the following results: Average length of life, 3.7 days; average number of eggs per female, 115.8; average number of eggs per day per female, 30.8. *Sciara* females in the laboratory laid their eggs singly or in groups of from 2 to 27, the average number of eggs per group being 5.03. These counts were made in the laboratory with a temperature fluctuating from 75° to 80° F. in the daytime and dropping to around 60° at night.

Sulphur fumigation does not injure compost.--According to Mr. Davis, recent observations in mushroom houses that were fumigated with sulphur

during "peak heat" indicated that the sulphur fumes produced by burning sulphur did no damage to the compost. In one instance the yield was around 2 pounds of mushrooms per square foot of bed space, whereas the average production is approximately $1\frac{1}{2}$ pounds per square foot.

Seasonal development of larger bulb fly.--C. F. Doucette and Ralph Schopp, of the Sumner, Wash., laboratory, report that throughout the winter months changes in the status of the larvae of the larger bulb fly (Merodon equestris Fab.) are not apparent. On March 21 at Olympia, Wash., 20 percent of all larvae, or 25 percent of the mature larvae, had left the bulbs to pupate. On March 23, 38 percent of all larvae, or 62 percent of the mature larvae, had left the bulbs. The seasonal development for 1935 is considered normal. At Sumner the larvae began to pupate the last of February. Considerable numbers of larvae left the bulbs after March 6 and their pupation was noted from 7 to 10 days later. It is believed that after leaving the bulbs, the larvae spend about a week in the soil before they pupate. This period may vary, however, with the soil temperature.

Bulb mite injury of Easter lilies.--Randall Latta, Sumner, in studying the effects of the feeding on the host plant of the bulb mite (Rhizoglyphus hyacinthi Bdv.), has found that when the lily bulb is dormant heavy infestations are usually centered on the outside lower scales. After growth starts the mites appear to attack the stem just at the nose of the bulb or slightly below the tip of the scales. In numerous plants examined the center of the stem was hollowed out at this point and feeding was observed to occur upwards to a point an inch above the soil level and downward to the basal plate. Feeding stops when the hard basal plate is reached. The stem is hollowed until it becomes weak and no longer able to support the weight of the foliage above. In preliminary control tests, in which mites were isolated from the bulbs and suspended in $\frac{1}{4}$ cubic centimeters of tap water in small vials and these in turn subjected for short periods to 110° F. in a constant-temperature water bath, it was found that eggs hatched in all samples up to and including 25 minutes, but none hatched in the 30-minute exposure. In similar tests, but in which the mites were treated in their natural environment within the bulbs, it was found that a 30-minute treatment effected complete control of the mites. This indicates that practically all mites are in positions easily accessible to water or other liquids, as no time was required for heat penetration.

INSECTS AFFECTING MAN AND ANIMALS

Preparations for extensive screw worm control campaign.--D. C. Parman, W. E. Dove, and E. W. Laake, in charge of the field laboratories at Uvalde, Tex., Savannah, Ga., and Dallas, Tex., respectively, spent several days in Washington during the latter part of March, conferring on plans to be followed in the proposed screw worm control campaign in the Southeast. Later, accompanied by F. C. Bishopp, they visited various points in the Southeastern States to determine the location of central field headquarters from which the control and research work will be directed. The control work will be under the supervision of Mr. Dove and the research phase of the program will be handled by Mr. Laake. Mr. Parman will be in direct charge of the work in

Mississippi. Under the proposed plan, the work will be carried out in cooperation with the various States. The Bureau of Entomology and Plant Quarantine will have full charge of the activities, and it is proposed to furnish to the farmers and stockmen the necessary medicine for treating infested animals, and the materials for building hospital pens and chutes; also to hold meetings and demonstrations to teach livestock owners approved methods of preventing screw worm infestations and of treating injured animals. The States are expected to cooperate in the work by providing for the proper distribution of materials and assisting in the organization of local communities for the employment of concerted control measures. Individuals in a community will be responsible for the actual treatment and handling of their stock.

Allantoin, a chemical substance found in maggot excretions, stimulates healing of wounds.--The remarkable healing effects produced by maggots in discharging wounds led to an analysis of their excretions to determine whether they introduce any substance into the wound which stimulates the healing process. Allantoin, a normal constituent of the urinary secretions of maggots and other animals, has been found to have healing properties. This material can be purchased, and when prepared as a weak solution and applied on gauze dressings to nonhealing wounds it promotes cleansing and healing. The claim is not made that this substance will replace maggots in the treatment of these wounds, as maggots appear to play a definite role which, so far, has not been duplicated. William Robinson, Washington, D. C., visited several hospitals in New York, Newark, N. J., and Pittsburgh, Pa., where the maggot treatment has been given extensive use. He conferred with the surgeons who are using this method and observed the very satisfactory results of this treatment in various cases of infected wounds. He also observed the healing effects of the allantoin treatment, which is being tried out in these hospitals.

Florida counties active in mosquito-control work.--According to reports made by W. V. King, Bureau representative in Florida, on a recent mosquito situation in that State, antimosquito measures are being pushed forward rapidly under the direction of county organizations. In St. Lucie County a P. W. A. project has been approved for the diking of several miles of marsh area as a combined sand fly and mosquito control measure. A marked reduction in mosquitoes last summer was reported from Martin County. The decrease in numbers of these pests was attributed to the C. W. A. and F. E. R. A. ditching projects. New antimosquito districts have been organized in Dade and Broward Counties to fight the Dengue-fever mosquito, and also the species that breed in the salt marshes.

FOREIGN PLANT QUARANTINES

Recent entomological interceptions of interest.--Twenty-one living larvae of the Mediterranean fruit fly were intercepted at San Pedro, Calif., in eight coffee berries in passenger's baggage from Hawaii. A pupa of this fruit fly was also taken at Chicago in a decayed tangerine in the mail from Italy. Eggs of the European tussock moth (Notolophus antiqua L.) arrived at Philadelphia on a Menetti leaf in cargo from the Netherlands. This lymantriid, which occurs in Europe and North America, is also known as the antique

tussock moth, rusty tussock moth, and vapourer moth. Egg masses have frequently been found on fruit and rose stocks from Europe. Phenacaspis dendrobii Kuw. was intercepted in May 1934, at Honolulu, Hawaii, on an orchid (Dendrobium draconis) in the mail from Siam. This represents the first interception record of this scale insect in our files. The alien scale Chrysomphalus alienus (Newstead) arrived at San Francisco on orchids in baggage from Guatemala. This scale insect is recorded from Florida. The sugarcane scale (Targionia sacchari (Ckll.)) was intercepted at Miami, Fla., on stalks of sugarcane from Nassau, Bahamas. A living specimen of the treehopper Nessorhinus gibberulus Stahl was collected last December on yam foliage in the field at Mayaguez, P. R. A living specimen of Exotochiomera oblonga Stahl (Lygaeidae) was taken at Nogales, Ariz., in a bell pepper arriving by truck from Mexico. Living larvae of the narcissus bulb fly (Merodon equestris Fab.) were intercepted last December at New York in cibollino (Muscari comosum) bulbs in cargo from Morocco. This syrphid has also been taken in hyacinth from the Netherlands and in narcissus from Canada, England, France, and the Netherlands. A living specimen of Mecistorhinus melanoleucus Westw. (Pentatomidae) arrived at Charleston, S. C., with banana debris in cargo from Guatemala. Specimens of Megastigmus bipunctatus (Swed.) were intercepted last November at Washington, D. C., with Juniperus sp. seed in the express from Issyk Kul, Union of Soviet Socialist Republics. A. B. Gahan, who made the identification, states: "This species is recorded in Europe as a parasite of Lepidoptera that infest juniper. In my opinion, however, the species is probably a seed chalcid in juniper seed."

Recent pathological interceptions of interest.--Albugo tragopogonis (DC. S. F. Gray was intercepted on Tragopogon porrifolius from France on February 6 at New York (first interception). Alternaria herculea (Ell. & Mart.) J. A. Elliott was intercepted at New York on February 13 on white greens (Brassica sp.) from Cuba (first interception). Bacterium citri Hasse was found on oranges from Japan on March 13 at Seattle and on March 14 at San Francisco; and on March 20 at San Francisco on citrus leaves, also from Japan. A bacterial pod spot of peas from Mexico was determined as Bacterium pisi (W. K. Sackett) E. F. S. on two lots intercepted at El Paso on March 8 (first interceptions so determined). Bacterium (citriputaele) syringae (van Hall) E. F. S. was intercepted from Spain for the first time on March 12 on two lots of lemons at New Orleans. Cercospora capsici Heald & Wolff was intercepted on March 4, and again on March 27, at New Orleans in cargo shipments of peppers from Cuba. The only previous interception was made in 1926. The second interception of Cercospora sp. on leeks from Japan was made at Philadelphia on March 13. The first interception of Colletotrichum atremantarius (B. & Br.) Taub. on potato was made March 14 at Gulfport, Miss., in potatoes from Italy. The disease had previously been intercepted on eggplant from Canada and Cuba. The first interception of the genus Gibberella on wood was an undetermined species found at New York on February 20 on cases from Mexico. Glomerella cingulata (Ston.) Sphauld. & Schrenk was intercepted on March 18 at New Orleans on chayotes from Cuba. We find no previous report of this disease on this host. Phyllosticta ruscicola Dur. & Mont. was intercepted on March 18 at Philadelphia on ruscus from Italy (first interception). Puccinia allii (DC.) Rud. was intercepted on February 17 at Philadelphia on garlic from Brazil. This is the first definite determination of this species among interceptions from South America. The fungus is not typical for the species, is apparently variable, and we do

not yet have a practical method for routine specific determinations of such material. Septoria drummondii Ell. & Ev. was intercepted on March 26 at the Washington inspection house on phlox from England (first interception). Septoria insularis B. & Br. was intercepted at the Washington inspection house on March 22 on Hedera sp. from England (first interception). Sphaeronema sp. was intercepted on March 22 at Philadelphia, our first interception of this genus on carrot. The material was from England.

Peony diseases intercepted from the Orient.--Pestalozzia sp. has been intercepted on peonies offered for entry from time to time and has been collected on imported material being grown in the field, but apparently no species of Pestalozzia has previously been reported as occurring on peony. From the standpoint of the mycologist, it is unfortunate that most material for peony disease interception either is too old or too young, and also too fragmentary, for study.

Bean pod borer from Mexico.--Three living larvae of Maruca testulalis Geyer were intercepted last January at Laredo, Tex., in string-bean pods in cargo from Mexico. While this olethreutid has been taken on numerous occasions in shipments from Cuba and has arrived from China, Dutch Guiana, Haiti, Hawaii, Japan, Puerto Rico, and Tahiti, this represents the first record in our files of this insect being intercepted from Mexico.

Star-apple with numerous fruit-fly larvae.--Eighteen living fruit fly larvae were intercepted recently at New York in a single star-apple in ship's stores from Jamaica. The fruit fly larvae were identified as Anastrepha acidusa Walk. (?). There were 30 fruits in all, 26 of which were destroyed on board ship and four of which were brought into the office for closer examination. One fruit of the four was found infested.

Boy's pocket yields infested mango.--Two boys crossing the bridge from Mexico at Brownsville, Tex., carrying no packages were released and were moving away when the plant-quarantine inspector noticed a peculiar swinging bulge in the hip pocket of one of them. They were called back and the bulge turned out to be, not the usual assortment of juvenile odds and ends, but a mango which on examination contained 2¹/₂ living larvae of the Mexican fruit fly (Anastrepha ludens Loew).

Suspicious-looking insect found on European celery.--An interception in New York on February 23 of a single pupa in celery root in ship's stores supposedly from Belgium has been reported to be a coleopterous insect belonging in the genus Atomaria. The interception is of definite interest, because one species of Atomaria (A. linearis) has been reported from Europe as doing considerable damage to beets. Although this pupa possibly represents another species than the one known to attack beets, its discovery is a definite indication that inspectors should be on the lookout for injurious species of this type.

Rice-straw dunnage matting harbors borer.--A small 2-foot square of coarse rice-straw matting of the type commonly used in the Orient for dunnage, was discovered on the pier in Baltimore on March 1. No objection is raised

to the presence of this material in the ship's hold, but the policy has been not to allow it to be taken on shore. The correctness of this attitude is well demonstrated in the present case; the Baltimore inspectors who examined the fragment of matting found in it three living larvae of Chilo simplex Butler, the Asiatic rice borer, an important pest of rice in the Orient.

DOMESTIC PLANT QUARANTINES

Chicago parcel-post frequency.--A careful survey of all incoming mail and express trains arriving at the various Chicago terminals has been worked out and charted, giving the frequency, by half-hour periods, when parcel post is available for inspection at the conveyor belt in the terminal post office, to determine whether shipments are being made in compliance with Federal domestic plant quarantines. The time of arrival of trains from all sections of the country, classed into 15 divisions in relation to areas under quarantine, is shown, as well as States of destination. Some 12,000 labels, removed from sacked mail by postal clerks during a 24-hour period when it was dumped onto the conveyor belt, were made available for the purpose of this analysis.

Freight-inspection systems reported.--Reports of systems of freight inspection used at both Philadelphia and Chicago have recently been received from inspectors of these stations. At Philadelphia, large quantities of freight pass through two transfer points, one of which is the largest transfer point in the East, while in Chicago freight must be checked at a large number of points. Each system is valuable as to the situation covered, and copies of the reports are being sent to transit inspectors at other cities.

Identification of elm.--The quarantine on Dutch elm disease having been placed effective February 25, it became necessary to provide inspectors with specific instructions as to the identification of dormant elm nursery stock. Such instructions were issued as Circular 52-T dated March 22.

Eradication of wild peach trees improves orchards.--Many peach growers in Georgia have recently expressed confidence that the eradication of escaped peach trees, a work carried on by the C. W. A. in the winter of 1934, has done much toward solving the problem of phony peach disease control. Other growers have commented on the noticeable decrease in the number of curculios infesting trees in orchards so protected, as compared with orchards not so protected.

Peach borers scarce in Texas nurseries.--Winter inspections for peach borers in Texas nurseries, in connection with certification with reference to the phony peach disease, resulted in finding remarkably few borers. Of the 57,507 trees inspected in 15 nurseries, only 18 trees were found infested, and 57 damaged, by borers. Their scarcity is believed to be due to the hot, dry summer.

Citrus canker inspections.--Of interest in the March work was the thorough inspection made of Galveston County, Tex., and the destruction by

that State of all Citrus trifoliata trees in the town of Alta Loma in Galveston County, where eight properties infected with the citrus canker were found during the winter. It is hoped that the destruction of these trees will aid in preventing a recurrence of the canker in this locality. Inspections made in Louisiana, Mississippi, and Alabama resulted in finding no citrus canker.

CONTROL INVESTIGATIONS

Toxicity of insecticides.--D. E. Fink, Orlando, Fla., has completed his study of the relative toxicity of optically active and inactive forms of dihydrodeguelin and isorotenone, the tests having been made against culicine mosquito larvae. The optically active compounds were decidedly more toxic than their optically inactive isomers. Optically active dihydrodeguelin was more toxic than rotenone.

New technique for rearing house flies.--W. N. Sullivan, Takoma Park, Md., is studying the possibilities of altering the usual method of rearing house flies for insecticidal tests so as to obtain puparia instead of adults. This may simplify the turntable method by making it unnecessary to chill flies for counting into petri dishes. Instead, the puparia can be counted into dishes and the flies treated in the usual way after emergence in the dishes. The percentage of emergence can easily be determined for each test by examining the puparia by transmitted light. R. H. Le Pelley, Kenya Colony, British East Africa, is to be a guest of the Takoma Park, Md., laboratory from April 9 to May 27, 1935. During this period he will use the turntable method for studying the action of mixtures of rotenone and the pyrethrins on house flies.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Weevil larva in carrot found at quarantine.--A coleopterous larva tentatively identified by A. G. Boving as Ceutorrhynchidius terminatus Hbst., was sent in from New York, collected in ship's stores on February 27, 1935, by K. F. Petsch (N. Y. No. 37256). This insect has been reported to be injurious in carrot fields in Denmark and is also recorded from England, but in wild carrot only.

A small beetle pupa intercepted in celery roots.--An advanced beetle pupa, presumably from Belgium and placed by Boving, Fisher, and Chapin as Atomaria sp. (family Cryptorhagidae), was collected at quarantine in New York in February 1935 (N. Y. No. 36620). The interception is of interest because one species of the genus, Atomaria linearis Stephens, has been reported doing much damage to beets in England, Germany, and France.

New North American weevil records.--Three exotic species of weevils, not heretofore reported from North America, have been found by L. L. Buchanan among specimens recently submitted for identification. One is a Sitona, evidently a European species, and possibly S. cylindricollis Fahr. The second is a species of Mallocherus, not specifically identifiable at present, but probably of Japanese origin. Both of these species were collected in

Connecticut by M. P. Zappe and submitted by W. E. Britton. The third species is the European Philopodon plagiatus Schaller, two specimens of which were collected on Amherst Island (Gulf of St. Lawrence) by the Bowdoin-MacMillan Arctic Expedition.

The genus Meteoridea rediscovered.--Included among parasites of the oriental fruit worm reared in Japan and Chosen, submitted by G. J. Haeussler and identified by C. F. W. Muesebeck, were two specimens of an apparently undescribed species of the braconid genus Meteoridea Ashmead. This genus was previously known only from a unique male specimen from Florida.

Irish shamrock yields immature leafhoppers.--Nymphs of a leafhopper tentatively identified by P. W. Oman as Megophthalmus scanius Fallen have been intercepted at quarantine recently. First-instar nymphs were obtained at Baltimore, Md., on March 14, 1935, by W. A. Ranck, and one second (or third) instar nymph at New York, N. Y., on March 13. The related Ulopa reticulata Fab. has been found previously on heather from England. Neither species is known to occur in this country.

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